Oil Field Environmental Incident Summary

Incident: 20130814114246 ***Date/Time of Notice:*** 08/14/2013 10:10

Responsible Party: MUREX PETROLEUM CORPORATION

Well Operator: MUREX PETROLEUM CORPORATION

Well Name: LEO HALLOF 1

Field Name: NORTH HAAS ***Well File #:*** 90074

Date Incident: **8/9/2013** ***Time Incident:*** 16:00 ***Facility ID Number:***

County: BOTTINEAU ***Twp:*** 163 ***Rng:*** 82 ***Sec:*** 21 ***Qtr:***

Location Description: Flowline leaked half way between Ralph Smith, tank battery, and Leo Hallof injection well.

Submitted By: Johan Garcia ***Received By:***

Contact Person: Paul Schaffner
515 N SAM HOUSTON PKY E
Suite 485
HOUSTON, TX 77060

General Land Use: Well/Facility Site ***Affected Medium:*** Soil and Water

Distance Nearest Occupied Building: 0.25 Miles

Distance Nearest Water Well: 0.25 Miles

Type of Incident: Valve/Piping Connection Leak

Release Contained in Dike: No ***Reported to NRC:*** Unknown

	Spilled	***Units***	***Recovered***	***Units***	***Followup***	***Units***
Oil	0	barrels	0	barrels		
Brine	0	barrels	0	barrels		
Other	0	barrels	0	barrels		

Description of Other Released Contaminant:

Inspected: ***Written Report Received:*** ***Clean Up Concluded:***

Risk Evaluation:

Areal Extent:
Unknown

Potential Environmental Impacts:
Some salt water did get into slough.

Action Taken or Planned:
Shut down unit, Strata will start remediation tomorrow 08/15/2013.

Wastes Disposal Location: Unknown

Agencies Involved:

Updates

Date: 8/13/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:
N.) 48 D 55' 44.9"
W.) -101 D 18' 52.4"

Arrived at location 4:30 PM 8/13/13.

Oil and brine released from pipeline leak. Brine flowed overland to the east into a large wetland. At the time of the first visit, there were several test pits that had been dug by the contractor, and a dike had been built to prevent further contamination of the nearby wetland.

Sample taken at wetland. Sample # WQSJS2013081301 - conductivity 1355 microsiemens.

Contractor said that the first chloride test taken at wetland tested out of range for his test strips, indicating the wetland had been contaminated. Testing with conductivity meter in same area confirmed test results with the edge of the wetland testing at 2.5 to 4 millisiemens, while 20 feet further out into the wetland tested at less than 1500 microsiemens.

Date: 8/15/2013 ***Status:*** Reviewed - Follow-up Required ***Author:*** Roberts, Kris

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Release from flow line off location. Followup is underway by Scott Stockdill.

Date: 8/16/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Returned to Leo Hallof site at 11:36 pm 8/16/2013.

Work halted due to rainfall event which prevented access with earthmoving equipment. Pipeline exposed. Loader and excavator at location. Work to resume Monday, according to contractor.

Conductivity in test pit nearest to wetland - 40.8 millisiemens.

Date: 8/20/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

10:24 AM CST 8/20/2013.

Called company contact and recommended that they test for BTEX and DRO in contaminated water. It was also recommended that they put in a recovery drain and sump to remove contaminated groundwater from the impacted area.

Date: 9/9/2013 ***Status:*** Correspondence ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Spoke with cleanup contractor at 9:37 AM 9/9/2013.

Contractor called to confirm BTEX and DRO samples should be taken. He also asked about where the samples should be taken. It was recommended that the impacted wetland, undisturbed soil near pipeline, and impacted groundwater be sampled for both BTEX and DRO. Work at Leo Hallof 1 has been stalled due to wet soil conditions.

Date: 9/10/2013 ***Status:*** Correspondence ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Email from contractor to Roberts 9/5/13:
This is the Leo Hallof 1. I visited this site twice in the week of Aug 12-16, 2013. I have been in contact with the Murex personnel, as well as the contractor on this job. This is the site where you asked that they put in a recovery drain and a sump to remove the impacted groundwater from the water table.

Date: 9/16/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location 9/16/2013.

Work has been stalled due to recent rains slowing remedial progress.

Followup required.

Date: 9/24/2013 ***Status:*** Correspondence ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Contacted Company Man

I (Scott Stockdill) was planning to investigate the remediation progress on Leo Hallof 1. I was told that no work had been done since my last visit due to recurring rains hampering progress.

More followup required.

Date: 10/9/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location at 4:05 PM 10/09/2013.

Met with the Bottineau Cty emergency manager, state representative and the landowner.

Concern about the spill, as well as the timeline associated with the cleanup, was being expressed. Areas of concern were tested with a conductivity meter. Results in PDF file in incident folder.

Two samples were taken for testing in Group 190: one at Test Area #3 (east of south excavation) and another at the site of the current excavation.

Meeting scheduled for Wednesday Oct 16 in Minot, ND with Murex, contractor, landowner, state representatives and NDDoH staff.

More followup required.

Date: 10/9/2013 ***Status:*** Inspection ***Author:*** O'Gorman, Brian

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location at 4:05 pm 10/9/13. Meeting with landowner, legislator, and concerned citizens. Took notes regarding EC levels for soils sampled with EC meter. First area tested with EC meter was southeast of excavation area in an area with no vegetation and white solutes on the surface. Results showed EC levels at 3.44 ms/cm at 0 to 3 inches, 2.60 ms/cm at 3 to 6 in, 2.64 ms/cm at 6 to 9 in, 2.35 ms/cm at 9 to 12 inches, 1.65 ms/cm at 12 to 15 inches, and 1.63 ms/cm at 15 to 18 inches.

EC samples were also recorded in the excavation area, starting on the floor of the excavation. The EC values from the floor of the excavation were all recorded from the 0- to 3-inch depth and covered 10 locations, starting from the southwest portion of the floor moving toward the eastern portion of the excavation floor. EC readings were recorded from previous locations gridded by Strata Excavating. The B2 location showed a 2.57 ms/cm; B3 location showed a 1.638 ms/cm; B2-T3 showed a 3.04 ms/cm; C2 showed a 1.04 ms/cm; B2-T4 showed a 10.60 ms/cm; C5 showed a 6.33 ms/cm; C6 showed a 6.91 ms/cm; and C2-T7 showed a 4.18 ms/cm reading. Four readings were taken within a foot surrounding the D4 location showing a 4.33 ms/cm reading north of the location, 9.70 ms/cm reading south of the D4 location, .956 ms/cm reading west of the D4 location, and 8.90 ms/cm reading south of the D4 location. EC values were also collected along the east wall of the excavation at varying depths, which were 1.84 ms/cm at 6", 8.70 ms/cm at 22", 1.26 ms/cm at 24", and 5.90 ms/cm at 30". Two puddles located along the pipeline in the western portion of the excavation were also sampled; a 63.0 ms/cm reading was recorded in the southwest puddle, and a 8.5 ms/cm reading was recorded in the northwest puddle.

Date: 10/16/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Murex-landowner meeting (Leo Hallof) at 10:00 AM 10/16/2013.

Meeting was held to clear up direction and status of the cleanup of the spill that occurred at the Leo Hallof 1 location. After a brief history of the spill that occurred (with a note of the date when cleanup contractor started 8-9-2013):

- Wet and soft ground since work began
- Salt is moving both vertically and somewhat laterally.
- Approximate size is 1 acre.
- Pie-shaped piece uncontaminated soil left in place

Concern was expressed by the landowner considering:

- Crop damage for the coming years
- Drain to cutback drain being cleaned shortly

Plan constructed with meeting with Murex, contractor, and ND Department of Health. The following recommendations were made:

- Get Extension Service involved on location.
- Sample area wetlands and locations on site to determine the extent of the contamination.
- Place no less than four monitoring wells.
- Place tiling to collect impacted water. The tile will be temporary and plugged once the remediation is complete.

Scott Stockdill and Kris Roberts will be on location at Leo Hallof 1 spill on 10/17/2013.

Date: 10/17/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived at location at 10:50 AM CST 10/17/2013. Meeting local landowners, company man, NW Landowners Group, contractor and USFWS staff.

Visit was to explain the proposed remediation technique to landowners and people with vested interest.
•Landowner gave the go-ahead on installing four monitoring wells.
•Both the landowner and the adjacent landowner object to pumping water that could be contaminated back into the wetland even if it is slightly above elevated levels.
•Landowner owns closest farmyard with water well present. No residence at farm yard.

Samples were taken:
•12:30-Murex, Ralph Smith 1, Ralph Smith 2 and Tootle Tank Battery-Brine, Group 190, Conductivity 240mS
•13:40-Murex Tootle Treater-Brine, Group 190, Conductivity 255mS
•14:30-Sample west excavation-impacted water, Group 190, Conductivity 7.46 mS
•15:0-Main wetland-impacted water, Group 190, Conductivity 1.18mS
•14:45-S excavation-impacted water, Group 190, Conductivity 2.74 mS
•14:55-N excavation-impacted water, Group 190, Conductivity 1.53 mS
•15:00-N test pit-impacted groundwater, Group 190, Conductivity 15.43 mS
•15:3-Background soil sample, Group 190
•15:40-Sample between SE and NE excavations, Group 190
•16:55-Background wetland 48 57.950', -101 21.206', Group 190, Conductivity 1.04 mS
•16:30- Background wetland 48 56.842, -101 16.730', Group 190, Conductivity 0.892 mS

17:10 Left location.

Date: 10/25/2013 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location at 10:45 CST 8/25/2013.

On location to supervise and observe the installation of four monitor wells at the Leo Hallof 1 location. Wells were drilled to a depth of 20' and screened between 10'-20'. Three of the four wells were dry, with one containing water. Two of the wells were placed at locations between the incident site and nearby domestic water sources. The wells were locked, and the key was put in the NDDoH's possession. Wells will be sampled within the next few weeks.

More followup required to ensure proper cleanup.

Date: 11/13/2013 ***Status:*** Inspection ***Author:*** Roberts, Kris

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

11/13/13 - 11:00, on location to develop the four installed monitoring wells and document progress in soil remediation.
Final excavation of impacted material was in progress and finished. Tile drains (3) in place, as well as the recovery sump; all three drains are plumbed too. Backfilling and compacting with dozer well underway. The two pond areas to east and southeast are being pumped dry and water sent to disposal. Ice cover will be filled over and allowed to melt in place.
The four monitoring wells were purged. All had water in them. pH and specific conductivity (SpC) was recorded as purging progressed. Data is below.
#1 - upgradient - approx. 2 feet water in the well. 1st 1/2 L - pH-6.96, SpC-9,760 uS/cm. At 3L removed, pH-7.05, SpC-9,650 uS/cm. Yield at 3L was <1/4 bailer.
#2 - south side of west pit - WL-8.82' below casing top. 1st bail, pH-6.79, SpC-4,700 uS/cm. At 11L, pH-6.82, SpC-4.69 uS/cm. At 21L, ph-6.82, SpC-4,750 uS/cm. At 29L, pH-6.86, SpC-4,920. Yield was less than 1/2 L/bail.
#3 - SE well - WL ~ 6 feet. 1st water pH-6.75, SpC-3,410 uS/cm. At 11L, pH-6.02, SpC-3,200 uS/cm. At 21L, pH-6.83, SpC-3,260 uS/cm. At 31L, pH-6.83, SpC-3,220 uS/cm. At 40L, yield was <1/2L/bail.
#4 - SW well - WL ~ 7 feet. At 3L, pH-7.33, SpC-10,340 uS/cm. At 13L, pH-6.95, SpC-10,900 uS/cm. At 21L, pH-7.01, SpC-7.01, SpC-11,080 uS/cm. At 30L, ph-7.07, SpC-11,470 uS.cm. Yield at 40L was <1/2L/bail.
None of the wells had expansion plugs at the top of the well casings, only duct tape over the open ends. Expansion plugs purchased in Minot, and they will be installed 11/14/13.

Date: 2/14/2014 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location at 15:30 2/14/14.

Excavations have been backfilled, and extraction points for the drain tile have been installed. At the time of the inspection, a road has yet to be built into the disposal well location. Follow up with Murex and Cody Vanderbusch on the construction process.

Follow up in spring to evaluate the remediation process.

Date: 6/5/2014 ***Status:*** Inspection ***Author:*** Roberts, Kris

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

5/29 and 6/4/14 on location. On 5/29, was on location with tour set up by ND Landowners Association and Ag Commissioner and ND senator. Used EC probe to check some areas that NDLOA believed had not been cleaned up appropriately. Did get some elevated EC readings in 3" depth range, but deeper and farther away from the excavation areas, readings were lower and possibly due to natural saline conditions.
6/4/14 on location to collect water samples from monitoring wells. Rains since 5/29 left soil too wet to access monitoring wells. Spoke with landowners to let them know we have been unable to collect samples. Will return week of June 17 to sample after meeting with parties on another remediation location nearby.

Date: 6/19/2014 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location 6/19/2014.

Samples collected at the monitor wells at the Leo Hallof 1 location.

More followup is necessary.

Date: 10/22/2014 ***Status:*** Correspondence ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Spoke with company rep at 15:14 10/22/2014.

Company rep is in the process of securing a company to complete the remediation of one of the damaged wells associated with the Leo Hallof 1 incident. Once a contractor has been hired, a sampling event is expected to take place.

More followup is necessary.

Date: 12/22/2014 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location 12/22/14.

Obtained GPS points from the monitor wells on location. New road has been built to the Leo Hallof 1 well location. A protective housing also has been built around the well head.

Monitor Well #1- N 48d 55' 45.6"
W -101d 18' 49"
Monitor Well #1- N 48d 55' 43.0"
W -101d 18' 50.5"
Monitor Well #3- N 48d 55' 40.7"
W -101d 18' 49.5"
Monitor Well #4- N 48d 55' 41.1"
W -101d 18' 52.8"

More followup is necessary.

Date: 10/5/2015 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location 14:00 10/5/2015.

Inspected the area that was impacted in August 2013, which has recently been planted to a cover crop. The cover crop has mixed results. Some of the impacted area has a good crop. Soil samples were taken in five different locations with duplicate samples taken by the NDDoH in three locations. The samples were taken down to various depths ranging from 0-6 inches to 36 inches. These samples will be run for the typical Group 190 samples.

More follow-up is necessary.

Date: 4/7/2016 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location 4/7/2016 at 10:00 AM.

Sampled MW-1 through MW-4, collection sump and wetland. Cover crop from 2015 appears to have done well in most locations, with some smaller areas that show stress.

More follow-up is necessary.

Date: 6/30/2016 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location 6/30/2016.

Impacted area has been planted to a typical cropping rotation for the first time since the incident. Standing water from recent rain is in the depressed area where the excavation occurred.

More follow-up is necessary.

Date: 9/7/2016 ***Status:*** Inspection ***Author:*** Stockdill, Scott

Updated Oil Volume:

Updated Salt Water Volume:

Updated Other Volume:

Updated Other Contaminant

Notes:

Arrived on location 9:30, 9/7/2016.

Oversaw the collection sampling at four soil boring locations 2' to 5' below surface grade (BSG) and 2' to 8' BSG. Split samples for produced water markers were taken at three locations.

More follow-up is necessary to ensure proper cleanup at the location.